

WHAT IS CLAIMED IS:

1. A method of dyeing a plastic article comprising:
  - (a) providing a plastic article comprising at least one polymer selected from thermoplastic polymer and thermoset polymer;
  - 5 (b) immersing at least a portion of said plastic article in a dye bath comprising,
    - (i) at least one dye,
    - (ii) water,
    - 10 (iii) at least one carrier represented by the following general formula I,



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wherein R is a radical selected from linear or branched C<sub>1</sub>-C<sub>18</sub> alkyl, benzyl, benzoyl and phenyl, and n is 2 or 3, and

- (iv) a diol selected from at least one of linear or branched C<sub>2</sub>-C<sub>20</sub> aliphatic diols, poly(C<sub>2</sub>-C<sub>4</sub> alkylene glycol), cycloaliphatic diols having from 5 to 8 carbon atoms in the cyclic ring, monocyclic aromatic diols, bisphenols and hydrogenated bisphenols;
- 20 (c) retaining said portion of said plastic article in said bath for a period of time at least sufficient to form a dyed plastic article; and
- 25 (d) removing said dyed plastic article from said bath.

2. The method of Claim 1 wherein said plastic article comprises a polymer selected from at least one of (co)polyesters, (co)polycarbonates, polyesterpolycarbonate copolymers, acrylonitrile-

butadiene-styrene copolymers, polyamides, polyurethanes,  
polyalkyl(meth)acrylate and styrene copolymers.

3. The method of Claim 1 wherein said dye bath comprises,  
5      0.001 to 0.5 percent by weight of said dye,  
      65 to 75 percent by weight of water,  
      15 to 25 percent by weight of said carrier, and  
      1 to 15 percent by weight of said diol,  
the percent weights being based on the total weight of said dye bath in  
10     each case.
4. The method of Claim 1 wherein said dye bath is maintained  
at a temperature of 25 to 99°C.
- 15     5. The method of Claim 1 wherein R is selected from linear or  
branched C<sub>1</sub>-C<sub>18</sub> alkyl, and n is 2.
6. The method of Claim 5 wherein R is selected from n-butyl, i-  
butyl and t-butyl.  
20     7. The method of Claim 1 wherein said dye bath further  
comprises a surfactant selected from at least one of: anionic surfactants;  
amphoteric surfactants; and a non-ionic surfactant selected from at least  
one of poly(C<sub>2</sub>-C<sub>4</sub> alkoxylated) C<sub>14</sub>-C<sub>18</sub> unsaturated fatty acids, poly(C<sub>2</sub>-C<sub>4</sub>  
25     alkoxylated) phenol and poly(C<sub>2</sub>-C<sub>4</sub> alkoxylated) C<sub>1</sub>-C<sub>9</sub> alkyl substituted  
phenol.
8. The method of Claim 7 wherein said surfactant is present in  
an amount of from 1 to 15 percent by weight, based on the total weight of  
30     the dye bath.

9. The method of Claim 1 wherein said diol is a poly(C<sub>2</sub>-C<sub>4</sub> alkylene glycol) selected from diethylene glycol, triethylene glycol, tetraethylene glycol, pentaethylene glycol and mixtures thereof.

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10. The method of Claim 9 wherein said diol is diethylene glycol.

11. The method of Claim 1 wherein said dye is selected from static dyes, photochromic dyes and combinations thereof.

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12. The method of Claim 11 wherein said dye is a water-insoluble static dye selected from the group consisting of azo dyes, diphenylamine dyes and anthraquinone dyes.

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13. The method of Claim 11 wherein said dye is a static dye, and said static dye is selected from the group consisting of disperse dyes, non-migratory static dyes and combinations thereof.

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14. The method of Claim 11 wherein said photochromic dye is selected from at least one of spiro(indoline)naphthoxazines, spiro(indoline)benoxazines, benzopyrans, naphthopyrans, organo-metal dithizonates, fulgides and fulgimides.

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15. The method of Claim 1 wherein said dye bath further comprises at least one of, UV stabilizers, optical brighteners, mold release agents, antistatic agents, thermal stabilizers, IR absorbers and antimicrobial agents.

16. The method of Claim 1 wherein said plastic article comprises at least one of pigments, crosslinked polymethylmethacrylate microspheres, glass microspheres and metal flakes.

5 17. The method of Claim 1 wherein said plastic article comprises a thermoplastic polycarbonate selected from at least one of thermoplastic aromatic polycarbonates and thermoplastic aliphatic polycarbonates.

10 18. The method of Claim 1 wherein said plastic article is a molded article comprising a thermoset polycarbonate.

19. The method of Claim 18 wherein said thermoset polycarbonate is a polymerize of a polymerizable composition comprising polyol(ally carbonate) monomers.

15 20. The method of Claim 1 wherein said plastic article is a molded article selected from shaped articles, films and sheets.

20 21. The method of Claim 20 wherein said molded article is a shaped article selected from optical lenses, ophthalmic lenses, sunshade lenses, face shields and glazings.

22. The method of Claim 1 wherein said plastic article is selected from thermoplastic pellets and thermoplastic strands.

25 23. The method of Claim 22 further comprising, melting at least one of said dyed thermoplastic pellets and said dyed thermoplastic strands to form a dyed molten thermoplastic composition, and  
30 introducing said dyed molten thermoplastic composition into a mold,

thereby forming a dyed shaped molded article.

24. The method of Claim 1 further comprising:

- (i) contacting said dye bath with particulate activated carbon to form a mixture of said dye bath and particulate activated carbon;
- (ii) isolating from said mixture a dye-free liquid comprising water, said carrier and said diol; and
- (iii) optionally adding at least one dye to said dye-free liquid, thereby forming a further dye bath.

25. The method of Claim 1 further comprising:

forming said dye bath by,

- (i) preparing a mixture of water, said carrier and said diol,
- (ii) introducing said dye into a filter, and
- (iii) passing said mixture over said dye and through said filter, thereby forming said dye bath; and

passing continuously said dye bath through said filter.

26. The method of Claim 1 further comprising,

introducing continuously said dye bath into an immersion tank through a plate having a plurality of perforations.

27. The method of Claim 1 further comprising contacting at least

a portion of the surface of the dyed plastic article removed from said dye bath with a rinse composition comprising water, and optionally at least one of said carrier (iii) and said diol (iv).